Test of Satellite Communications Systems on-board Suborbital Platforms to provide low-cost data communications for Research Payloads, Payload Operators, and Space Vehicle Operators

Problem Statement

NASA and commercial developers of orbital and suborbital spacecraft have a constant need to lower the cost of 2-way air-to-ground data transmission. Satwest's technology directly addresses this issue under TA05. Satwest customers for this technology improvement apply to NASA, as well as commercial spacecraft developers/operators. Both entities are under constant pressure to keep costs as low as possible..

- Potential users of the matured technology: NASA; FAA; Suborbital Reusable Launch Vehicles (sRLV) operators; sRLV payload specialists; Science payload developers and operators.

Technology Development Team

- M. Brian Barnett, Satwest LLC, barnett@satwest.com (PI)
- Funding POC: Satwest, M. Brian Barnett.
- Letters of support: Virgin Galactic, Iridium, Armadillo Aerospace.

Proposed Flight Experiment

Experiment Readiness:

- The experiment will be ready for flight April 2013

Test Vehicles:

- sRLV; High Altitude Balloon

Test Environment:

- Parts of the experiment hardware have previously flown on an UP Aero sounding rocket (May 2011). The best test environment through FOP is on board Spaceship 2 & non-spin stabilized vertical sRLV.
- Preferred launch site: Spaceport America

- Test Apparatus Description:
- The initial test equipment includes an Iridium 9575 satellite phone handset, and externally mounted antenna, and cables.

Technology Maturation

- Satwest's proposed satellite network and hardware is at TRL 9 for ground and aircraft applications. However, the system has not been tested above 70,000 feet or at spacecraft velocities. Spaceflights will demonstrate the efficacy of the technology at spacecraft velocities and 100km altitude.
- To mature the technology and the associated timeline, Satwest proposes to fly the equipment on multiple occasions, on multiple platforms during the next 12-24 months. The test results will provide information of additional hardware/software, if any, should be further developed to reach TRL 6 for spaceflight applications. State the deadline, if any, to mature the technology to TRL 6 or higher.: Satwest would like to be ready to support sRLV commercial operations.

Objective of Proposed Experiment

- To test that the Iridium satellite network and equipment can provide data communications for research payloads and spacecraft tracking during suborbital flights & high altitude balloon flights..
- The expected flight data will be tracking data, text messaging uplink, and text messaging, internet and voice with crewed missions). The data will be used to advance Satwest's technology development effort by letting us know if it works at suborbital speeds and altitudes.

Technology Areas addressed by your technology. TA05 Communication and Navigation/TA08 Science Instruments, Observations and Sensor Systems